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AUTHOR(S):

Uitto, Juha I.; Shaw, Rajib

CITATION:

Uitto, Juha I. ...[et al]. Adaptation to changing climate: promoting community-based approaches in the developing countries. SANSAI : An Environmental Journal for the Global Community 2006, 1: 93-107

ISSUE DATE:

2006-01

URL:

http://hdl.handle.net/2433/108256

Adaptation to changing climate: promoting community-based approaches in the developing countries

JUHA I. UITTO & RAJIB SHAW

Abstract: Climate change is a reality, although its specific impacts in various parts of the world are unknown. In addition to the long-term effort of curbing greenhouse gas emissions, it is essential to be prepared for shorter-term changes. Adaptation to climate change will be a major challenge to vulnerable communities, especially in coastal areas and regions susceptible to climatic hazards, such as floods and drought. This article describes two innovative international initiatives designed to test and pilot approaches to community-based adaptation in developing countries. Their goal is to generate knowledge about how to achieve adaptation at the local level and ultimately to reduce community vulnerability to climate-related hazards. Emphasis is given to participatory approaches to planning, implementation, monitoring and evaluation that promote the identification of successful strategies and learning from experience. In order to achieve sustainability and the replication of effective initiatives, it is essential to incorporate climate risk and disaster management into local development policies.

Keywords: climate change, adaptation, human security, risk and disaster management, community-based approaches.

Introduction

Climate change is a reality that few scientists question these days. The evidence of global warming spurred by human activities is overwhelming. There is, however, significant uncertainty about its impacts. Possible impacts vary considerably from place to place and go far beyond simply higher average temperatures or rising sea levels that will leave low-lying coastal areas and small islands particularly vulnerable (Pelling and Uitto 2001). Rainfall patterns are likely to change, causing droughts in certain areas and floods in others. Evidence shows that there is a tendency for heightened extremes, whereby the already wet areas are becoming wetter, while arid areas are becoming increasing dry (Dore 2005). While the mean annual rainfall may not change substantially, it is possible that rain will be concentrated in shorter periods of time,

separated by longer dry spells in between. Such changes may have dramatic effects on agriculture and food production. In coastal areas, there is some evidence that storm intensity may be on the increase because of increases in sea surface temperature, although the evidence is still inconclusive (Webster et al. 2005). On the other hand, in mountainous regions the horizontal zonation of vegetation makes biodiversity and agriculture particularly vulnerable to even small changes in climate.

While we can now predict climate change with some degree of accuracy on the global scale, the uncertainties increase as we move to regional, national and local levels. Similarly, the feedback loops in climate are so complex that even powerful computer simulations produce unreliable results over longer time horizons and smaller geographical scales.

Most of the attention has focused on mitigating climate change through international treaties and the development of new technologies to curb greenhouse gas emissions. This is certainly useful in the long term. However, mitigation by necessity requires a long time period. Even if we stopped all emissions today – an obviously impossible proposition – the greenhouse gases already in the atmosphere would ensure that the momentum of climate change would continue for decades. Therefore, a more urgent task is to reduce the vulnerability of populations and societies to the impacts of climate change. In this paper, we argue that the key is to increase the resilience of society against climatic hazards by increasing the adaptive capacity of communities and by effective risk management.

We start with a brief description of the broader context, including the international policy frameworks for dealing with climate change adaptation, recent trends in disaster risk management, and emerging approaches towards community-based adaptation to climate change. We then discuss two new international development projects aimed at reducing disaster vulnerability and promoting adaptation to climate change at community level in the developing countries. The final part of the paper focuses on the importance of monitoring, evaluation and learning in order to assess the results and impacts of innovative adaptation activities, and to learn from them. We emphasise the need for community participation in setting the goals and monitoring their attainment.

Context

The United Nations Framework Convention on Climate Change (UNFCCC) recognises the need for both mitigation and adaptation as a response to dealing with global warming. However, concrete actions towards adaptation have been initiated only

relatively recently. Established in 1991, the Global Environment Facility (GEF) was designated as the UNFCCC's official financial mechanism to help fund projects and programmes in the developing countries in accordance with the convention's commitments. It was only in the early 2000s that the GEF was authorised by its governing body to start funding activities related to climate change adaptation. Donors had proved reluctant to support adaptation activities because it was feared that adaptation would consume all the funds available for the climate change focal area in the GEF, leaving little or no funding to promote the reduction of greenhouse gas emissions in the programme countries. Furthermore, the GEF's mandate is to help developing countries to protect the global environment. Although the need for adaptation arises from the global problem of climate change, its benefits accrue primarily at the national level. Therefore, it was argued that GEF funds should not be used to pay for local development actions. In the end, however, it was agreed that the GEF could start planning activities in adaptation to climate change that would provide multiple benefits at both local and global levels (GEF 2000). Examples of such activities were identified as protecting (i) ecosystems that would be uniquely stressed or modified by climate change; (ii) carbon sinks vulnerable to deforestation or land degradation as a result of climate change; and (iii) agriculture and other productive systems from climate variability. In approving a new framework for capacity building, the GEF Council recognised vulnerability and adaptation assessments as specific capacity needs that countries need to develop to promote global environmental management (GEF 2001). Finally, at the seventh session of the Conference of the Parties to UNFCCC, held in October 2001 (COP7), the GEF was requested to operate two new funds related to the convention (the Special Climate Change Fund and the Least Developed Countries Fund) as well as a new fund related to the Kyoto Protocol (the Adaptation Fund). All three funds had the scope to support adaptation (GEF 2002).

In response, the United Nations Development Programme (UNDP) and Environment Programme (UNEP) undertook to develop a National Adaptation Programme of Action (NAPA) funded by the GEF. The NAPA proposed to support the efforts of the least developed countries to address the urgent need to adapt to the adverse effects of climate change and to report on progress to UNFCCC. To guide the GEF in its newly agreed support for climate change adaptation, UNDP established a dedicated Capacity Development and Adaptation Cluster and developed an Adaptation Policy Framework (Lim et al. 2005). The Adaptation Policy Framework recognises stakeholder participation as crucial to any activities supported. Under it, local communities must be

recognised as key stakeholders. Furthermore, the NAPA process focuses explicitly on the use of existing information and traditional knowledge.

These approaches build directly upon recognised participatory principles that have emerged over the past couple of decades in development studies (e.g., Chambers 1997). In recent times, participation has been recognised also as a key to successful disaster risk management. It is now understood that disaster risk is closely related to societal processes and the sustainability of resource use and management.

Community-based adaptation and disaster risk management

Disasters result from complex interactions between human and natural systems. It has been argued convincingly that there is no such thing as a purely natural disaster. Disasters only occur when a natural phenomenon – a hazard such as an earthquake or storm – affects a human population or community that is exposed and vulnerable to it.

Risk is therefore a function of exposure to the hazard, the vulnerability of people (in terms, for example, of their settlement and livelihood), and the degree to which society has engaged in disaster mitigation activities. Furthermore, people's capacity to protect themselves and to cope with hazards is an important factor that needs to be recognised. This can be expressed in a simple equation, where R = risk; H = hazard (an extreme event or process); V = vulnerability; M = mitigation; and C = capacity:

$$R = \frac{(H \times V) - M}{C}$$

The above can also be explained as R = f (H, V, M, C), which means that risk is a function of hazard, vulnerability, mitigation and capacity. This is a general way of expressing risk without showing the empirical relationship.

Disasters always have a social dimension and, whatever their cause, their effects are invariably rooted in societal processes that render certain groups or individuals particularly vulnerable to their impacts (Wisner et al. 2003). Disasters also have geographical and time dimensions rendering certain areas particularly vulnerable, while societal dynamics may change the vulnerability of particular areas or groups and individuals over time (Uitto 1998). While such social interpretations of disaster are not new (e.g., Burton et al. 1978), they have become more widely accepted and increasingly sophisticated over time (e.g., Hewitt 1997; Pelling 2003; UNDP 2004). A number of studies have accordingly addressed the issue of vulnerability assessment

(e.g., Adger et al. 2001; Briguglio 1995; Downing and Patwardhan 2004; Luers 2005; Shea and Shubbiah 2004).

The UN World Conference on Disaster Reduction (WCDR 2005) has reviewed the current trend in disaster risk management and recognised the need for community-based approaches. Communities worldwide have co-existed with disasters from the earliest of times. Their mechanisms for coping with natural disasters have protected and nurtured the very existence of their civilisations. Therefore, their indigenous knowledge and methodologies should be considered and, where appropriate, adopted and imparted to reduce disaster risks at the global level.

Decentralisation in disaster management is considered to be another important aspect that emphasises the capacity enhancement in the local governments. Multi-sectoral and multi-stakeholder partnership in disaster management is a crucial concept in the course of promoting integrated disaster management at all levels. Partnerships have facilitated holistic approaches to disaster management involving all constituents. Such partnerships have also helped to reduce redundancy and duplication of disaster management efforts, whereby cooperation and collaboration have been achieved.

As more researches on development are conducted in various fields, the approach to disaster mitigation is becoming increasingly community-based (Blaikie et al. 1994; Mileti 2001), and much more effort is being put into incorporating disaster management aspects into the holistic development of communities (Twigg and Bhatt 1998, Shaw and Okazaki 2003). Maskrey (1989) has rightly pointed out that disaster management should not be treated as one single issue but should be incorporated into the socioeconomic activities of local people. The rationale for community involvement or community-based activities is now well rehearsed (Twigg 1999). Because community-based activities and organisations are rooted deeply in the society and culture of an area, they enable people to express their real needs and priorities. This allows problems to be defined correctly and responsive measures to be designed and implemented. Twigg also argues that since the existence of community-based organisations allows people to respond to emergencies rapidly, efficiently and fairly, available community resources (even where these are limited) will be used economically. Maskrey (1989) pointed out that "top-down" programmes in which communities are not involved tend not to reach those worst affected by disaster, and may even make them more vulnerable. This is found to be similar in developing and developed countries, as argued by Shaw and Goda (2003).

It has been observed that effective and successful disaster reduction initiatives and responses are often attributed to the spontaneous participation of communities and the

people affected (Shaw and Okazaki 2003). There are two key challenges to community-based disaster management: one, to ensure the sustainability of its initiatives and, two, to integrate them into local development policies. These challenges are obviously two sides of the same coin, in that both aim to ensure a continued and systematic approach that sees disaster risk reduction as a central dimension of local development. Tools are currently being developed that seek to facilitate this integrated level of community-based disaster management (e.g., Shaw and Okazaki 2004) but more needs to be done. In particular, the risk from climate change and the need to assist communities to adapt to its impacts pose new and additional challenges. We argue that the practical, field-level experiences gained in grassroots disaster management can provide valuable lessons for incorporating climate risk into development plans.

Initiatives on community-based climate change adaptation

In this section, we describe two new international initiatives that aim to develop community-based approaches to managing risk and reducing vulnerability in the face of global climate change. Both projects are still in the early stages of implementation, so it is too soon to analyse their results and impacts. Consequently, emphasis is given instead to an assessment of the monitoring and evaluation systems that have been set in place to ensure the projects will reach their objectives and lessons are learned for future operations.

1. Enhancing human security, environment and disaster management in Vietnam

Human security is concerned with reducing and, when possible, removing the insecurities plaguing human lives. Linking human security to environmental factors is still a relatively novel concern. In its most pronounced dimension, it pertains to people's dependence on and access to natural resources. Environmental resources are a critical part of the livelihoods of many people. When these resources are threatened because of environmental changes, people's security is also threatened. It is often the poor and communities in rural areas that are most dependent on natural resources for their survival and, consequently, they are the most affected by environmental change.

Disaster management has a close correlation with human security. Many disasters, such as drought and floods, are found to be directly related to environmental degradation. Climate change, as discussed above, has added a new level of uncertainty to the equation. Again, such disasters affect poor people the most through the impacts

on their lives, livelihoods and properties. Therefore, our goal is to create disaster resilient communities in order to enhance human security.

"Enhancing human security, environment and disaster management" is a new project that started recently in the Thua Thien Hue province of central Vietnam. The project was developed jointly by the Canadian Centre of International Development and Cooperation (CECI) and Kyoto University's Graduate School of Global Environmental Studies. It received funding from the Asian Development Bank. The project works with local partners in Vietnam, including Hue University, the Ministry of Natural Resources and Environment, and the Institute of Meteorology and Hydrology. Importantly, its approach involves communities living in the Phu Loc district, where the field activities are located.

Vietnam, a country located in the tropical monsoon zone close to the typhoon centre of the Western Pacific, is a highly disaster-prone country. It is estimated that 70% of the country's 73 million inhabitants live in disaster-prone areas. Thua Thien Hue province in the central part of Vietnam is subject to severe climatic hazards, including typhoons, floods, droughts, forest fires and landslides. All of these cause annual devastation. There are indications that climate change has worsened these conditions in recent years, in bringing about unusual rainfall patterns, prolonged dry periods and the diversion of the typhoon path, etc. Particularly vulnerable are rural populations living in mountainous areas and the province's coastal zones.

The project aims to develop a model for community-based climate change adaptation, which can be applied in differing socio-economic conditions. The goal is to enhance human security in the project area by enabling communities to better cope with the climate change impacts, including floods and cyclones. The specific objectives are to:

- study and analyse climate change impacts on communities and livelihoods in the project area;
- undertake training and awareness-raising programmes at the village, commune and district levels;
- initiate participatory planning processes at the village, commune and district levels;
- implement pilot sub-projects under the village-commune-district plans developed by the project in a participatory manner; and
- monitor and analyse the implementation process and the development of the community-based climate change adaptation model.

While the project only commenced in 2005, considerable progress has already been made, in particular with regard to the participatory approaches at different levels. It is most encouraging that both the local communities and government entities have taken a keen interest in the project, even taking over its ownership. The external executing partners from CECI and Kyoto University are primarily providing technical assistance to the local entities, whose project this has already become. It is hoped that the project will generate new knowledge about climate change impacts, local livelihood and coping strategies, and how these capacities can be developed to reduce climate related disaster vulnerability in central Vietnam. Emphasis is placed on identifying successful approaches, disseminating them widely, and integrating them into local development policies in order to enhance their sustainability and replication.

Three major steps are being adopted in the project. The first step, assessment, focuses on producing a scenario; the second step, planning, seeks to produce a plan, and the third step will look at implementation, in particular in terms of conducting actions as sub-projects. The characteristic of the sub-project implementation is co-financing from the local government (at commune-level) and individual funding from the beneficiaries. This process creates a strong sense of project ownership in the local community and will, therefore, ensure the project's sustainability at the grass-roots level. During the planning stage, two types of plans will be produced. "Safer village" plans look at disaster preparedness and people's safety while "safer production" plans consider how to secure livelihood, especially for agriculture, aquaculture and animal husbandry. Both types of plans need to be developed in close cooperation with local governments to ensure their linkage to the development plans. In the third phase, selective activities of the planning process will be implemented through co-financing from the project and the local communities.

To enhance human security at the personal and community level, the government-people linkage is of utmost importance. This is particularly relevant to rural areas, where people's livelihood depends largely on activities such as agriculture and aquaculture that are strongly affected by the local government policies and programmes. In terms of climate change impact, people naturally relate most to how it affects their lives and livelihoods. Local governments are concerned with policy, plans and extension services (the latter provide a variety of services and training programs on livelihood issues), the effectiveness of which can reduce the impacts of climate change. However, most of the climate change negotiation is confined to central and national governments oriented towards policy and international negotiation; for this reason, most climate scenarios do not percolate down to the local level. Where climate change

adaptation is concerned, all activities in the field (demonstration projects, training activities, awareness-raising activities) need to be reflected in the local government policies and programmes if they are to be sustainable. A strong partnership between people and government is extremely important. Civil society and academia play an important role in strengthening this partnership and ensuring its long-term sustainability through policy integration. Self-governance and local governance are the key factors in ensuring policy integration.

2. Pilot programme on community-based adaptation

It is recognised that small local communities are often the most affected by the impacts of climate change, yet the least equipped to cope with and recover from them. Adaptation to climate variability has, of course, always taken place. Indeed, local peoples, depending on the natural environment for their survival, must constantly modify their livelihoods and adapt to changing conditions (Brookfield 2001). However, not all communities have an equal capacity to adapt. Furthermore, the anthropogenic climate change that we are starting to experience now poses a new challenge, as the changes in weather patterns and associated hazards may be larger and occur faster than at any time in history.

In response to these challenges, the GEF has decided to develop activities to facilitate community-based adaptation to climate impacts. As this is still a new area of intervention, it is important to identify and test approaches that will be successful and to build the capacities of the organisations involved. With this in mind, UNDP has initiated a pilot community-based adaptation (CBA) programme that will provide a basis upon which the GEF can develop its support for small-scale adaptation activities. The objectives of the programme have been defined as:

- development of a framework, including new knowledge and capacity, that spans the local to the intergovernmental levels (cross-scale "policy laboratories") to respond to unique community-based adaptation needs;
- identification and financing of diverse community-based adaptation projects (small-scale "policy laboratories") in selected countries; and
- capture and dissemination of lessons learnt at the community level to all stakeholders, including governments.

The CBA pilot programme will operate initially in four countries with widely different ecological, social, economic and political conditions and, consequently, diverse climate adaptation challenges. The countries selected are Bangladesh, a

low-lying deltaic country facing severe threats from floods, storms, saltwater intrusions and sea-level rise; Bolivia, in particular the Andean highlands, where elevation changes pose particular challenges to agriculture and biodiversity protection; Niger, a Sahelian country plagued by drought and restricted water availability; and Samoa, a small island developing state particularly vulnerable to a variety of climate impacts. Starting with these diverse pilot sites, the programme will be expanded to cover 10 countries with varying situations that can provide lessons on how to best address the issues related to climate change vulnerability. The pilot programme will eventually support 80-200 small-scale CBA projects in the 10 countries. The goal is to develop approaches that can help developing countries to enhance the resilience and capacity of communities to cope with and adapt to climate change.

It is foreseen that the adaptation activities needed in order to respond to the different climate impacts may take very different shapes. For instance, in a drought-prone area like Niger, where land degradation is a major problem, food security will be a major concern. Therefore, solutions may be related to maintaining the production base through watershed management, forestry for containing the encroachment of dunes, and water resources management. In low-lying coastal environments, such as those found in Bangladesh or Samoa, it will be important to focus on protecting freshwater supplies from salinisation through seawater intrusions.

It is also important to recognise that not all solutions to community-level problems can be found at the local level. Commonly, the causes of vulnerability or barriers to coping are found at societal levels and may be rooted in social and economic realities or government policies. Clearly, there are no standard solutions. For this reason, the pilot programme places a heavy emphasis on monitoring and evaluation in order to find out what works and what does not, and which approaches have the best chances of being replicated elsewhere.

Assessing results and promoting learning

Monitoring and evaluation (M&E) consist of tools and methodologies that can play a central role in enhancing the achievement of results and impacts of projects and programmes. M&E has multiple purposes that can be summarised as:

- providing timely information to project managers and other stakeholders to enable them to engage in adaptive management;
- ensuring accountability for the effective and efficient use of funds and activities;

- providing feedback and learning for ongoing and future activities regarding successful approaches and challenges; and
- assessing and reporting on the results and impacts of the project or programme.

Effective M&E must take as its starting point the goals and objectives of the programme, project or activities; in this case, reducing the vulnerability of communities to climate-related hazards and increasing their adaptive capacity. It is important to bear in mind that the policy environment plays a central role in facilitating adaptation. Therefore, the goal must be to identify policy advice that can lead to a better environment that will enable communities to become more resilient. Ultimately, the goal must be a measurable change in the scale or frequency of disasters, with fewer material and human losses.

In order for the M&E system to be able to help management and stakeholders decide whether a given project is achieving its set objectives, there is a need to establish baselines against which change can be measured. Baselines are required for all key dimensions that the programme and projects attempt to address, including:

- climatic variability and hazard;
- vulnerability of communities, people and places;
- existing livelihood and coping strategies that translate into adaptive capacity; and
- obstacles to coping or desired change that may be found at policy level.

As we are talking about community-based projects, it is important to build in participatory approaches to M&E. Traditionally, M&E systems have focused on providing information to project and programme managers and funding organisations. However, it is important to engage the communities themselves in M&E to foster ownership of the project and the processes it involves. Participatory M&E is an integral part of community empowerment that allows communities themselves to set their own goals, strategies and indicators, and to actively monitor and evaluate whether they are moving towards achieving them. Community involvement in M&E will also enhance transparency and accountability in resource use. Participatory approaches to M&E are now gaining prominence in development literature and being employed in the field (Ukaga and Maser 2004; Vernooy et al. 2003; World Bank 2002). Specific attention should be given to the following aspects: 1) the progress, results and impacts of the project at community level; 2) the progress and effectiveness of institutions, processes

and mechanisms that have been established; 3) the identification of policy obstacles and necessary improvements and whether these are being incorporated into existing policies; and 4) the lessons for the future.

Experience shows that it is recommendable to build upon existing systems and structures to the greatest extent possible. Integration into already extant structures facilitates sustainability. Although the M&E system is established particularly for the purpose of the project at hand, there are advantages to keeping the monitoring system going once the project is over, in order to ensure that the project impacts are sustainable. To this end, it is important to choose the right monitoring system at the appropriate level. For example, it would be most appropriate to monitor the construction, operation and maintenance of community-level infrastructure at the local level, while monitoring policy integration would require higher-level monitoring at the district, provincial or national level. In the case of the project in Vietnam described above, the plan would be to utilise existing commune mechanisms for monitoring any physical infrastructure work, while mass organisations, such as the Women's Union and Farmers' Union, would be engaged in monitoring the training activities. The district and provincial authorities would need to be involved in monitoring policy integration.

While M&E systems should devise a limited number of indicators that are easily available and measurable for day-to-day monitoring, it is also important to remember that indicators can never provide the entire picture. They are by necessity simplifications of a complex truth. Therefore, it is necessary to use a broader range of methods and tools. A baseline survey that sets the benchmarks against which progress and achievements can be measured is needed and should be followed by a post evaluation when project activities are completed. However, it is always necessary to listen to the people who are the intended beneficiaries of the project. Two-way communication is essential to discover stakeholders' experiences and perceptions of successful approaches. This is particularly important so that M&E can be used effectively for adaptive management and for identifying lessons for the future.

Conclusions

Adaptation to climate change is still a relatively new area, although it is rapidly gathering recognition. Experiences and approaches developed in community-based disaster management are very useful for adaptation activities at the local level. The projects introduced in this article are examples of international efforts aimed at developing and testing innovative solutions to reducing community vulnerability,

increasing resilience and enhancing capacity in the face of climate-related hazards. We have argued that, for this purpose, documenting and analysing experiences of what works and what does not is particularly important. Monitoring and evaluation can be powerful tools for learning for the future, provided they are not used only for accountability purposes. Involving and empowering communities to define their own goals, strategies and M&E will significantly enhance ownership and the participatory development and learning processes. The M&E systems should help the communities keep track of the progress in project implementation, its outcomes and long-term impacts.

A key consideration is the sustainability of the adaptation initiatives. Externally funded pilot projects are by definition time-bound and limited in their scope. It is essential that successful initiatives and approaches are continued, expanded, disseminated and replicated beyond the initial project. For this to happen, communities must recognise the benefits and see the value of investing their own resources in such activities. Equally important is the integration of disaster risk management and climate change adaptation into local government policies. Only then can their sustainability and replication be guaranteed, and people and communities rendered safer from climate-related hazards.

Acknowledgements

Juha Uitto acknowledges the financial support of Kyoto University Foundation, which has enabled him to conduct cooperative research in Kyoto University and write this paper. Rajib Shaw acknowledges the Ministry of Education Sports Culture Science and Technology (MEXT) Grant (project code 816051600006, subject code no.17401004) which financed field research in Vietnam. Discussion with the partners in Vietnam has helped to improve the understanding of field context.

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Juha I. Uitto is Senior Evaluation Adviser in the Evaluation Office of the United Nations Development Programme (UNDP), New York, USA. He has two decades of experience in the management, monitoring and evaluation of international development projects and programmes, especially in the fields related to environment, resource management and hazards. A geographer by training, Juha Uitto received his MSc from the University of Helsinki in his native Finland, and PhD from Lund University in Sweden. The views expressed in the article are those of the authors and do not necessarily reflect the position of UNDP.

Rajib Shaw is Associate Professor in the Graduate School of Global Environmental Studies at Kyoto University, Japan. His main expertise is environment and disaster management, and his research interests are community-based risk management, urban risk management, development learning (risk education) and climate change adaptation. He is currently leading research projects related to community-based disaster risk management in Vietnam, India, Nepal, Indonesia, Philippines and Sri Lanka. He received his MSc from Yokohama National University and DSc from Osaka City University. Before joining Kyoto University, Rajib Shaw worked at the United Nations and was engaged in community-based project implementation in Asia.